AMENDMENT

IN THE CLAIMS

The following Listing of Claims, will replace all prior versions, and listings, of claims in the application.

LISTING OF CLAIMS

1-39 (Canceled).

40. (Previously Amended) An electron source as recited in claim **51**, wherein said nano-structures are substantially vertical.

41. (Previously Amended) An electron source as recited in claim **51**, wherein said nano-structures are individually spaced apart.

42. (Previously Amended) An electron source as recited in claim **51**, wherein said emitter-to-gate distance for each nano-structure is substantially less than one micrometer.

43. (Previously Amended) An electron source as recited in claim **51**, wherein the nano-structures have a surface density substantially higher than $10^6/cm^2$.

44. (Previously Amended) An electron source as recited in claim **51**, wherein the nano-structures protrude above the surface of the emitting layer for not more than half of one micrometer.

45. (Previously Amended) An electron source as recited in claim **51**, wherein the apertures in the insulator expose the entire protrusion portion of the nano-structures in the emitting layer.

46. (Previously Amended) An electron source as recited in claim **51**, wherein the nano-structures have at least one of their three dimensions in the nanometer range.

47. (Previously Amended) An electron source as recited in claim **51**, wherein the nano-structures include nano-tubes, nano-wires, nano-fibers, and nano-cones.

48. (Previously Amended) An electron source as recited in claim **51**, wherein the nano-structures have a coating for enhanced field emission performance.

49. (Previously Amended) A display as recited in claim **64**, wherein the nano-structures are selected from a group of materials consisting of carbon, refractory metals and alloys, conductive ceramics, conductive ceramic composites, and doped semiconductors.

50. (Previously Amended) A display as recited in claim **49**, wherein the carbon includes carbon nano-tube, carbon nano-fiber, and carbon nano-cone.

51. (Previously Amended) An emission electron source comprising:

a cathode electrode disposed on a substrate, the cathode electrode for providing a source of electrons;

an emitter layer disposed over said cathode electrode and formed from a composition of a non-porous embedding material and one or a plurality of nano-structures embedded therein, the embedding material having a surface above which portions of the nano-structures protrude to emit electrons;

an insulator disposed over the emitter layer, the insulator having one or a plurality of apertures, each exposing at least the ends of the nano-structures in the emitter layer; and

a gate electrode disposed over the insulator and having one or a plurality of apertures, wherein each aperture exposes a single nano-structure and is concentrically self-aligned with the end of the nano-structure, the gate electrode being operative to control the emission of electrons through the apertures from the exposed nano-structures;

wherein the nano-structures comprise a nonconductive core and a conductive shell.

52. (Previously presented) An electron source as recited in claim **51**,

wherein the nonconductive core is made from one of wide band gap semiconductors, including diamond, BN, AlN, AlGaN, GaN, GaAs, SiC, and ZnO.

53. (Canceled)

54. (Canceled)

55. (Currently Amended) An emission electron source comprising:

a cathode electrode disposed on a substrate, the cathode electrode for providing a source of electrons;

an emitter layer disposed over said cathode electrode and formed from a composition of an embedding material and one or a plurality of nano-structures embedded therein, the embedding material having a surface[[,]] above which portions of the nano-structures protrude to emit electrons;

an insulator disposed over the emitter layer, the insulator having one or a plurality of apertures, each exposing at least the ends of the nano-structures in the emitter layer; and

a gate electrode disposed over the insulator and having one or a plurality of apertures, wherein each aperture exposes a single nano-structure and is concentrically self-aligned with the end of the nano-structure, the gate electrode being operative to control the emission of electrons through the apertures from the exposed nano-structures;

wherein the insulator and the embedding material are composed of the same dielectric material.

56. (Canceled)

57. (Previously Amended) An electron source as recited in claim **51**,

wherein the cathode electrode is configured as a plurality of electrically isolated cathode electrodes, each for supplying an independent source of electrons;

wherein the gate electrode is configured as a plurality of electrically isolated electrodes, each intersecting with said cathode electrodes and having one or a plurality of apertures at each intersections, each gate electrode being operative to control the emission of electrons through the apertures along the gate electrode; and

wherein activation of a selected cathode and a selected gate electrode determines an intersection where the nano-structures emit electrons.

Claims 58 - 63 (Canceled)

64. (Currently Amended) A display comprising:

an electron source that includes:

a cathode electrode disposed on a substrate, the cathode electrode for providing a source of electrons;

an emitter layer disposed over said cathode electrode and formed from a composition of an embedding material and one or a plurality of nano-structures embedded therein, the embedding material having a surface over which portions of the nano-structures protrude to emit electrons[[ ]];

an insulator disposed over the emitter layer, the insulator having one or a plurality of apertures, each exposing at least the ends of the nano-structures in the emitter layer; and

a gate electrode disposed over the insulator and having one or a plurality of apertures, wherein each aperture exposes a single nano-structure and is concentrically self-aligned with the end of the nano-structure, the gate electrode being operative to control the emission of electrons through the apertures from the exposed nano-structures; and

an anode plate including a transparent anode electrode disposed over a glass substrate and a phosphor screen disposed over the anode electrode, the anode plate being positioned opposite to said electron source with a vacuum gap disposed therebetween;

wherein electrons are emitted from said nano-structures by applying a voltage between said cathode and gate electrodes, and are made incident on said phosphor screen to make luminous said phosphor screen.

65. (Previously Presented) A display as recited in claim **64**, wherein the nano-structures are substantially vertical.

66. (Previously Presented) A display as recited in claim **64**, wherein the emitter-to-gate distance for each emitter is substantially less than one micrometer.

67. (Previously Presented) A display as recited in claim **64**, wherein the nano-structures have a surface density substantially higher than $10^6/cm^2$.

68. (Previously Amended) A display as recited in claim **64**,

wherein the cathode electrode is configured as a plurality of strip-like cathode electrodes extending substantially in the same direction in such a manner as to be spaced from each other at intervals in a direction transverse to the cathode strips, each cathode strip for providing an independent source of electrons;

wherein the gate electrode is configured as a plurality of strip-like gate electrodes extending orthogonal to the cathode strips so as to intersect said plurality of cathode electrodes and to be spaced from each other at intervals in a direction transverse to the gate strips, and having one or a plurality of

apertures at each intersection, each gate electrode for controlling the emission of electrons through the apertures along the gate electrode; and

wherein the anode electrode is configured as a plurality of strip-like anode electrodes each extending in such a manner as to be opposed to the corresponding one of said gate electrodes.

69. (Canceled)

70. (Canceled)

71. (Previously Amended) An electron source as recited in claim **51**, wherein said nano-structures are grown using a template and said template is at least part of the embedding material.

72. (Canceled)

73. (Canceled)

74. (Previously Amended) An electron source as recited in claim **51**, wherein said nano-structures are truncated to substantially the same length.

75. (Currently Presented) A display as recited in claim **64**, wherein said nano-structures in the emitter layer are truncated to substantially the same length[[,]] so that each exposed nano-structure in the gate aperture has substantially the same gate-to-emitter distance.

76. (Previously Presented) A display as recited in claim **64**, wherein the nano-structures have at least one of their three dimensions in the nanometer range.

77. (Previously Presented) A display as recited in claim **64**, wherein the nano-structures include nano-tubes, nano-wires, nano-fibers, and nano-cones.

78. (Previously Presented) A display as recited in claim **64**, wherein the nano-structures have a coating for enhanced field emission performance.

79. (Previously Presented) A display as recited in claim **64**, wherein the nano-structures comprise a nonconductive core and a conductive shell.

80. (Previously Presented) A display as recited in claim **79**, wherein the nonconductive core is made from one of wide band gap semiconductors, including diamond, BN, AlN, AlGaN, GaN, GaAs, SiC, and ZnO.

81. (Previously Presented) A display as recited in claim **64**, wherein said nano-structures are individually spaced apart.

82. (Canceled)

83. (Canceled)

84. (Previously Presented) A display as recited in claim **64**, wherein the insulator and the embedding material are composed of the same dielectric material.

85. (Previously Presented) A display as recited in claim **64**, wherein said insulator functions also as the embedding material.

86. (Previously Amended) A display as recited in claim **64**, wherein the embedding material includes a template that was used to grow the nano-structures.